

INTRODUCTION OF COMPUTER SCIENCES

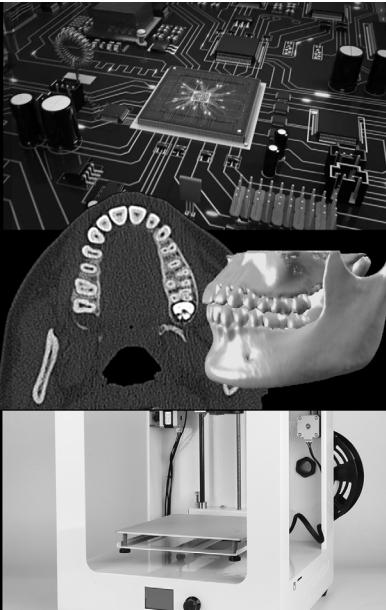
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Course Materials – CFLu's Website

http://cflu.lab.nycu.edu.tw/CFLu_course_CompSci.html

Introduction of Computer Science (UnderGraduate)

Compulsory Course for the first-grade Undergraduate Students

Lecturer: Chia-Feng Lu (alvin4016@nycu.edu.tw)

計算機概論 (醫放射、物輔系大一)

授課教師：盧家鋒



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COMPUTER SCIENCES

- Computer Architecture 電腦架構
- Data Storage & manipulation 資料儲傳&運算
- Data Abstractions 資料結構
- Operating Systems 作業系統
- Networking and Internet 區域網路與網際網路
- Algorithms 演算法
- Programming Language 程式語言
- Database Systems 資料庫系統
- Computer Graphics 電腦繪圖
- Artificial Intelligence 人工智慧

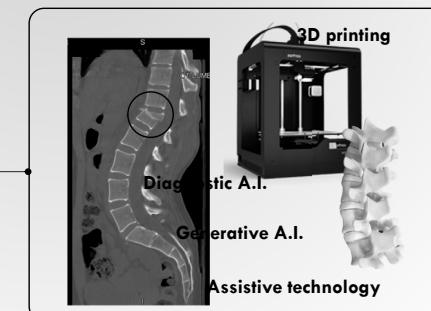
for others but NOT me !



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THE UGLY TRUTH IS...

- Everything in your daily life/work is connected to computers!



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THE UGLY TRUTH IS...

Think about this...

- Can you pick a suitable computer/notebook for yourself?
- Do you know the specifications of the computer?
- What's the use of computers? Accessing the internet, playing games, watching videos, reading/writing reports...
- Can you fix a computer problem, such as the issues with the internet, blue screen, or computer crash?

Actually, computers and medicine are closely related.

- Statistical analysis, image processing, assistive diagnosis, medical device design, 3D modeling and printing, artificial intelligence

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What are the Goals of This Course?

First Goal...

- In the age of information explosion, don't be a student like computer illiterate!

Second Goal...

- Old-school is not the fashion. You are the modern

**Radiation
Technologist**

**Physical
Therapist**

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Computer Sciences - Syllabus

	Topics
Class 1	Course introduction and overview
Class 2	Language preparation for EMI course
Class 3	Knowing your computer I (components: CPU, RAM, HDD)
Class 4	Knowing your computer II (components: Motherboard, graphic card)
Class 5 (9/29)	Off
Class 6 (10/6)	Off
Class 7	Knowing your computer III (components: power, DVD/BD, monitor)
Class 8	Knowing your computer IV (manager of computers: operating system)
Class 9	Customizing your computer - DIY (demands, performance vs price)

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Computer Sciences - Syllabus

	Topics
Class 10 (11/3)	Midterm exam – team competition
Class 11	Community and Security of computers (Introduction of internet)
Class 12	Introduction of artificial intelligence
Class 13	Introduction and practice of ChatGPT
Class 14	Applications of ChatGPT
Class 15	Using generative AI as a critical thinker
Class 16 (12/15)	Final Report & Discussion

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Assessment

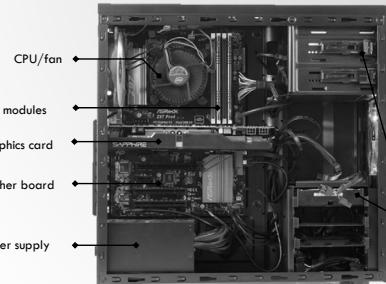
- Participation of class discussion/activities: 30%
- Midterm team competition: 30%
 - Virtual purchasing in groups of 4 to 5 people to purchase computers with limited amount and demand conditions.
- Final team project: 40%
 - Applications of AI/ChatGPT



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Components of Computer

Desktop computer



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Notebook



https://news.samsung.com/

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Specification of Computer

What does this mean ??



- CPU處理器 : Intel® Core™ i9-12900 5.1 GHz (30 MB Cache, 16 cores)
- Chipset晶片組 : Intel® Q670
- RAM記憶體 : 32GB Dual Channel DDR5 4800 MHz
- Hard drive硬碟 : Intel M.2 SSD 1TB + 1TBx1 SATA3 3.5" 硬碟
- Display顯示介面 : NVIDIA GeForce RTX4060 8GB, HDMI/DP(8K support)
- Optical drive光碟機 : DVD-RW recorder
- Operating system作業系統 : Windows 11 Professional

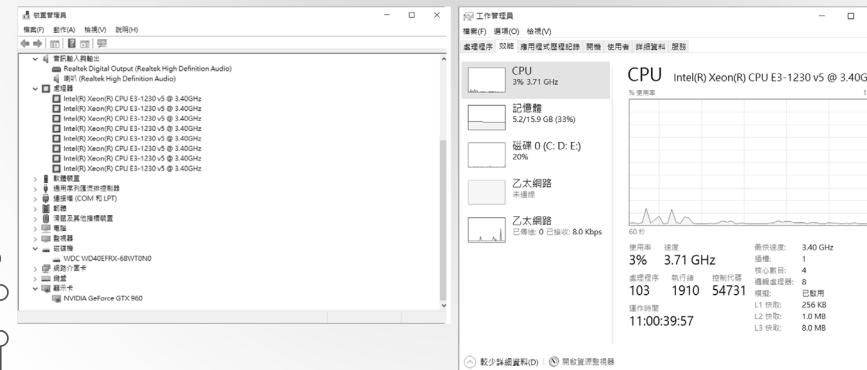
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Monitoring Your Computer

- Check components and performance

Basic Version



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Monitoring Your Computer

- Check components and performance

CPU-Z System information software

Processor
Name: Intel Xeon E3-1230
Code Name: Skylake
Padage: Socket 1151 LGA
Technology: 14 nm
Core Voltage: 0.880 V
Specification: Intel® Xeon® CPU E3-1230 v5 @ 3.40GHz
Family: 6
Model: E
Stepping: 3
Ext. Family: 6
Ext. Model: SE
Revision: R0
Instructions: MMX, SSE, SSE2, SSE3, SSE4.1, SSE4.2, EM64T, AES, AVX, AVX2, FMA3, TSX

Clock (Core #0)
Core Speed: 3691.86 MHz
Multiplier: x 37.0 (8 - 38)
Bus Speed: 99.71 MHz
Rated FSB: 8 MB/s
Cache: 4 x 32 Kbytes 8-way
L1 Data: 4 x 32 Kbytes 8-way
L1 Inst: 4 x 32 Kbytes 8-way
Level 2: 4 x 256 Kbytes 4-way
Level 3: 8 MB/s 16-way

BIOS
Brand: American Megatrends Inc.
Version: 0303
Date: 01/25/2016

Graphic Interface
Version: PCI-Express x16
Link Width: x16
PCI-Express: Max. Supported x16
Side Band Addressing

CPU-Z Ver. 1.78.1.x64 Tools Validate Close

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CPU-Z Ver. 1.78.1.x64 Tools Validate Close

GPU
Name: NVIDIA GeForce GTX 960
Board Manuf: ASUSTek Computer Inc.
Code Name: GM206
Revision: A1
Technology: 28 nm

Clocks
Core: 135 MHz
Shader: 405 MHz
Memory: 4096 MB/s
Type: GDDR5
Bus Width

CPU-Z Ver. 1.78.1.x64 Tools Validate Close

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ContaCT / Viz LVO



Sends notifications to a neurovascular specialist that a suspected large vessel occlusion

ECG App



Determine the presence of atrial fibrillation (AF) or sinus rhythm (SR) on a classifiable waveform.

IDX-DR



Automatically detect more than mild diabetic retinopathy in adults diagnosed with diabetes.

OsteoDetector



Analyze wrist radiographs using machine learning to identify and highlight distal radius fractures.

Real-time Multi-Person 2D Pose Estimation Using Part Affinity Fields

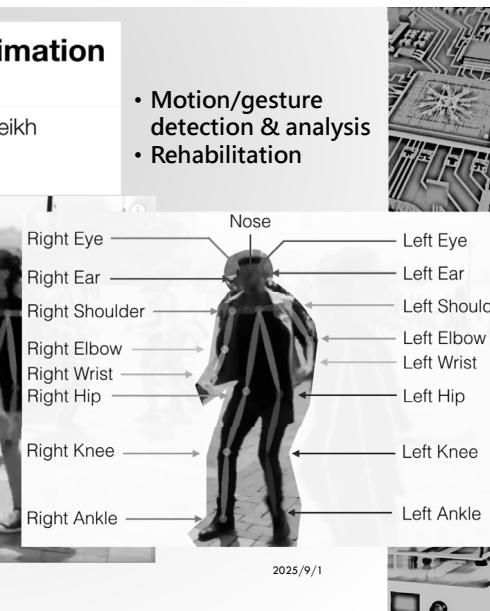
Zhe Cao, Tomas Simon, Shih-En Wei, Yaser Sheikh
Carnegie Mellon University



<https://www.youtube.com/watch?v=pW6nZXeWIGM>

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- Motion/gesture detection & analysis
- Rehabilitation



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What can ChatGPT do for me?

- 院长找我寫計畫，請幫我委婉拒絕，100字以內。
- English as a medium of instruction 成功的要素有哪些？
- What is the common pathology of gliomas?
- What is the MRI technique for the diagnosis of ischemic stroke?
- What is patient screening procedure for MRI exam?

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Intended Learning Outcomes

- Understand the essential computer knowledge and skills for life (first half of semester).
- Apply what you learned to purchase a suitable computer and use artificial intelligence (last half of semester).

Learning, communication, and teamwork!

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THE END

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